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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,384	12/06/2001	Gary F. Feierbach	04860P2679	2221

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EXAMINER

DATSKOVSKIY, MICHAEL V

ART UNIT	PAPER NUMBER
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2835

MAIL DATE	DELIVERY MODE
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07/05/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/020,384

Applicant(s)

FEIERBACH, GARY F.

Examiner

Michael V. Datskovskiy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7, 9-13, 15-23, 25-29, 31-35, 42, 43, 45 and 46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 9-13, 15-23, 25-29, 31-35, 42, 43, 45 and 46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5, 7, 9, 10-13, 15-20, 21-23, 25-29, 31, 42-43, 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al (Previously cited US Patent 4,729,060) in view of Bramhall et al (UK Patent GB 2 109 996 A).

Yamamoto et al teach a cooling device 10, Figs.1, 11, for removing heat from an integral circuit (IC) 7, said cooling device comprising: a conduit 1; a sealed flexible channel 5 having a first open end and a second thermally conductive closed end 3, said flexible channel is made of a resilient material having spring-like characteristics and

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providing a spring-like restoring force when compressed, said second end thermally conductive material (copper) having a substantially planar surface to interface directly with said IC 7 when said flexible channel is extended; an interconnect openings between said flexible channel and said conduit to allow a fluid to move between said conduit and said flexible channel; and a port for coupling to a pump 25 coupled to said conduit 1. Yamamoto et al teach furthermore a heat sink 75 having plurality of flow diverters –a plurality of spaced apart planar fins 77, said heat sink being attached to an interior surface of said closed end 3 in the compressed and extended positions to conduct heat absorbed by said closed end through said heat sink to said cooling fluid contained within said conduit 1 and said flexible channel 5. Yamamoto et al teach furthermore said resilient material could be pleated (co. 4, line 44). With respect to claim 20: Since applicant has not provided any specific heating elements either in the drawings or in the disclosure, examiner assumes that the heat generating IC heats coolant while being cooled by it. Yamamoto et al do not teach said flexible channel alternating between a compressed position and an extended position when said pump reduces or increases a cooling fluid pressure (produces some range of vacuum or non-vacuum pressure), wherein said flexible channel compresses and removes from said IC and when said pump increases a cooling fluid pressure said flexible channel expands and moves toward said IC to contact it and to dissipate heat a generated by an integrated circuit. (Examiner has to point out that Yamamoto et al teach all necessary structure for performing such operations, including a possibility of controlling the hydraulic pressure of the coolant by the pump 29, (see col. 6, lines 26-29). Therefore,

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Yamamoto et al lacks only a method of using an apparatus similar to the proposed invention apparatus). Bramhall et al teach a cooling device, Figs.1-3, for removing heat from a semiconductor wafer 8, said cooling device comprising: conduits 30, 23; a sealed flexible channel 20 having a first open end and a second thermally conductive closed end 18, said flexible channel is made of a resilient material having spring-like characteristics and providing a spring-like restoring force when compressed, said second end having a substantially planar surface to interface directly with said semiconductor wafer 8 when said flexible channel is extended; an interconnect openings between said flexible channel and said conduit to allow a fluid to move between said conduit and said flexible channel. Bramhall et al teaches furthermore when a pump 36 reduces a cooling fluid pressure (produces some range of vacuum pressure), said flexible channel compresses and removes from said semiconductor wafer 8, and when said pump 36 increases a cooling fluid pressure said flexible channel expands and moves toward said semiconductor wafer 8 to contact it and to dissipate a generated heat; and said fluid could be heated (page 2, lines 45-93). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an existing fluid pump in the device by Yamamoto et al to extend or compress a flexible channel in the device by Yamamoto et al as it is shown in the device by Bramhall et al in order to facilitate removal of the electronic device. Regarding to the claims 12, 13, 17, 18, 26, 27, 28, 43 and 46: Yamamoto et al and Bramhall et al teach all the limitations of the claims except certain ranges of the cooling fluid pressure to manipulate compressing or extending of said flexible channel. It would have been obvious to one

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having ordinary skill in the art at the time the invention was made to control the hydraulic pressure of the coolant by the pump 29 in the device by Yamamoto et al and Bramhall et al in the ranges claimed in the claims above, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. With respect to claim 9: Yamamoto et al and Bramhall et al teach all the limitations of the claim except certain types of materials used to make said flexible channel. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make said closed end heat sink and said flexible channel from such claimed materials, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, (*In re Leshin*, 125 USPQ 416).

With respect to claims 4, 5: Yamamoto et al and Bramhall et al teach all the limitations of the claim except said cooling device as in Claim 1, wherein said open end is coupled with said conduit by a technique selected from the group consisting of soldering, sauntering, welding, and adhering. These process limitations have not been given patentable weight, since it is well settled that the presence of process limitations in product claims, which product does not otherwise distinguish over the prior art, cannot impart patentability to that product. (*In re Johnson*, 157 USPQ 670, 1968).

4. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al and Bramhall et al as applied to claims 1 above, and further in view of Novotny (Previously cited US Patent 5,206,791).

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Yamamoto et al and Bramhall et al teach all the limitations of the claim except cooling device as in Claim I wherein said conduit is a heat pipe,. Novotny teaches a cooling device, Figs.1-4, for removing heat from an integral circuit (IC) 12, said cooling device comprising: a conduit 14; a sealed flexible channel 10 having a first open end and a second thermally conductive closed end 11, said flexible channel is made of a resilient material having spring-like characteristics and providing a spring-like restoring force when compressed; said second end 11 having a substantially planar surface to interface directly with said IC 12 when said flexible channel is extended; an interconnect openings between said flexible channel and said conduit to allow a fluid to move between said conduit and said flexible channel. Novotny teaches furthermore a heat sink having plurality of flow diverters –a plurality of spaced apart planar fins 20, said heat sink being attached to an interior surface of said closed end 11 to conduct heat absorbed by said closed end through said heat sink to said cooling fluid contained within said conduit 14 and said flexible channel 10. Novotny teaches furthermore said conduit 14 is a heat pipe connected to a reservoir 19 containing said fluid. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make said conduit in the device by Yamamoto et al and Bramhall et al in form of a heat pipe as it is disclosed by Novotny, in order to enhance heat dissipation.

5. Claims 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al in view of Bramhall et al and Novotny as applied to claim 32 above, and further in view of Hisano (Previously cited US Patent 5,198,889).

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Yamamoto et al in view of Bramhall et al and Novotny teach all the limitations of the claims, including a reservoir 19 coupled with the heat pipe conduit, said heat pipe inherently containing a gas and a liquid coolant, except wicking material contained within said heat pipe. Hisano et al teach a cooling device, Fig. 29, for removing heat from an integral circuit 1 (IC), said cooling device comprising: a conduit 81b; a sealed flexible channel 81a having a first open end and a second thermally conductive closed end 82, said flexible channel is made of a resilient material, said second end thermally conductive material having a substantially planar surface to interface directly with said IC 1; an interconnect openings between said flexible channel and said conduit to allow a fluid to move between said conduit and said flexible channel 81a; wherein said conduit 81b is a heat pipe comprising a wicking material (col.18, lines 19-22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a heat pipe comprising a wicking material, as Hisano e, in order to enhance heat dissipation by the heat pipe.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V. Datskovskiy whose telephone number is (571)272-2040. The examiner can normally be reached on 8:30am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash N. Ganghi can be reached on (571)272-3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Michael V Datskovskiy
Primary Examiner
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06/27/2007